

# OZONE AND CHILDREN'S HEALTH: TOWARD IMPROVING CONSIDERATION IN AIR QUALITY DECISIONS

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**Background and Aims:** Ozone, regulated by the U.S. Environmental Protection Agency (EPA) under the National Ambient Air Quality Standards, has been shown to have detrimental effects on human respiratory health, with some of the greatest effects seen in children and asthmatics. EPA must rely on the epidemiologic data to understand how ozone impacts susceptible populations, such as children. This work aimed to understand the current state of the science, identify data gaps and other important considerations, and propose ideas for filling the data gaps, in an effort to improve comparison across studies of the effects of ozone on children's respiratory health.

**Methods:** A literature search was conducted to identify peer-reviewed epidemiology studies with child subjects and ozone air pollution exposure; results were restricted to respiratory-related effects. A review of the studies was completed, comparing/contrasting methods including: exposures, outcomes, lags, co-pollutants, confounders and effect modifiers, and other variables. Data gaps were qualitatively analyzed, and the relative strengths and weaknesses of the studies were assessed.

**Results:** Over forty studies were identified, with varying subject ages, ozone exposure classification and measurement, co-pollutants, model types, confounders, and outcomes (ranging from expiratory measures to school absences). Data gaps were identified, including the need for data concerning the consequences of long-term ozone exposure and the lack of understanding of ozone effect(s) during gestation and early development.

**Conclusions:** There are inconsistencies in the methods and results of the ozone epidemiology literature focusing on children's health, which may hinder the ability of science decision-makers to incorporate all of the available research into policy recommendations. It is hoped that this analysis will enable key data gaps on the effects of ozone on children's respiratory health to be filled, and will aid the consideration of this research in future decisions regarding air quality improvement.